FIG. 1

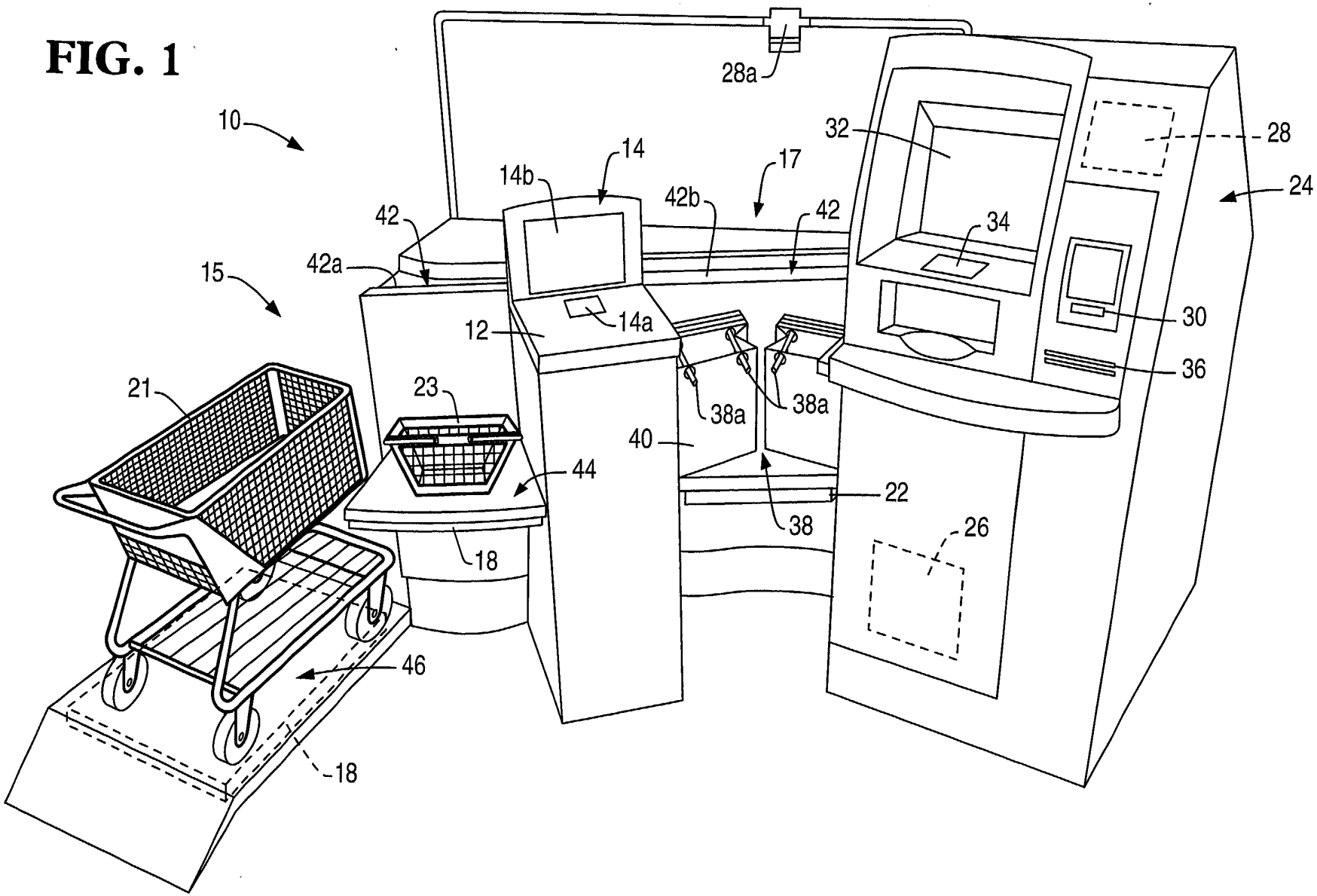

10
15
28a
32
28
24
14
14b
17
42b
42
42
42a
34
12
14a
30
36
21
23
38a
38a
40
44
22
38
26
18
46
18

FIG. 2

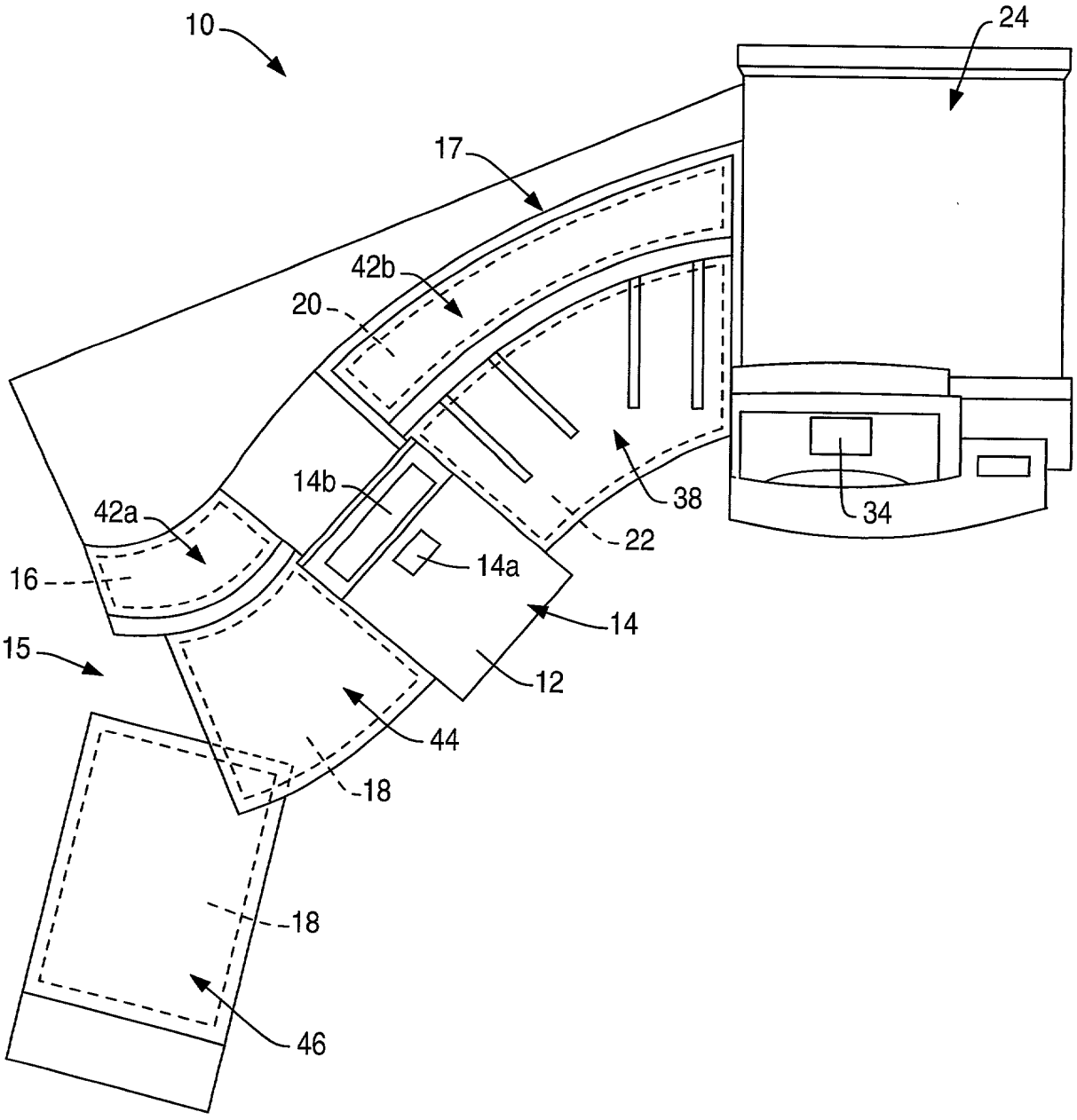


FIG. 3

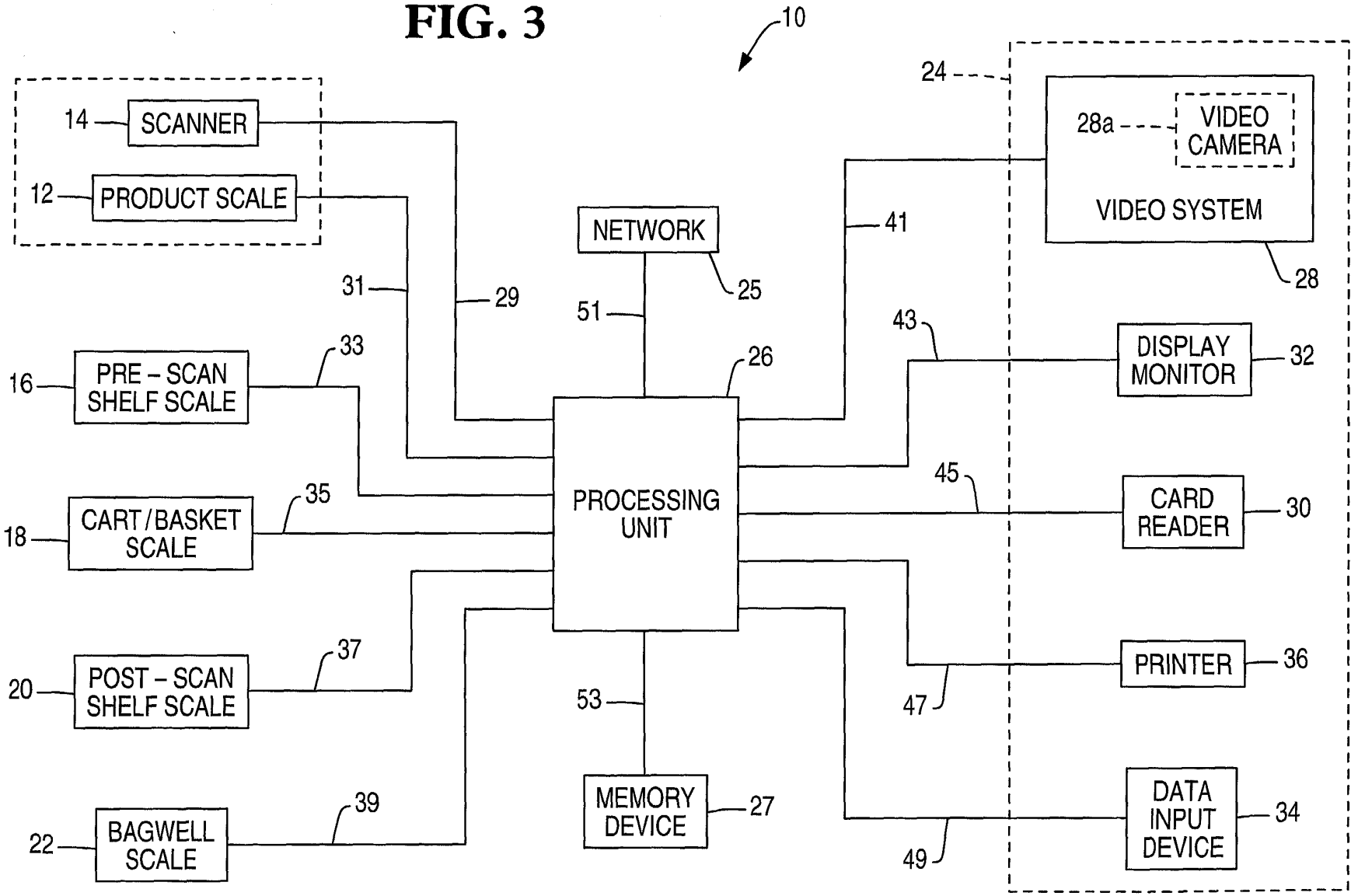

10
14
SCANNER
12
PRODUCT SCALE
31
29
NETWORK
25
51
41
24
28a
VIDEO CAMERA
VIDEO SYSTEM
28
43
DISPLAY MONITOR
32
26
16
PRE – SCAN SHELF SCALE
33
PROCESSING UNIT
45
CARD READER
30
18
CART/BASKET SCALE
35
20
POST – SCAN SHELF SCALE
37
53
47
PRINTER
36
MEMORY DEVICE
27
22
BAGWELL SCALE
39
49
DATA INPUT DEVICE
34

FIG. 4

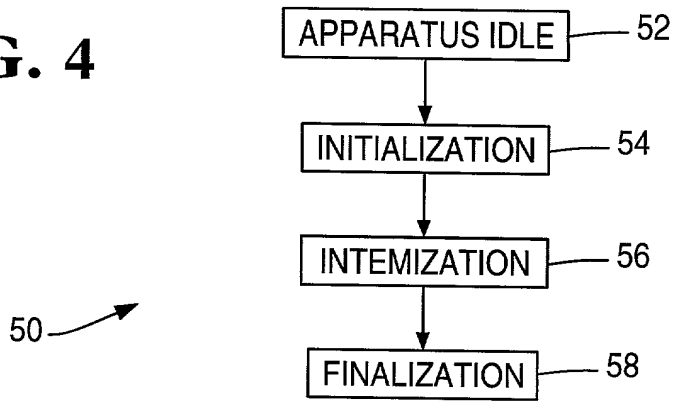

APPARATUS IDLE
52
INITIALIZATION
54
INTEMIZATION
56
FINALIZATION
58
50

FIG. 7

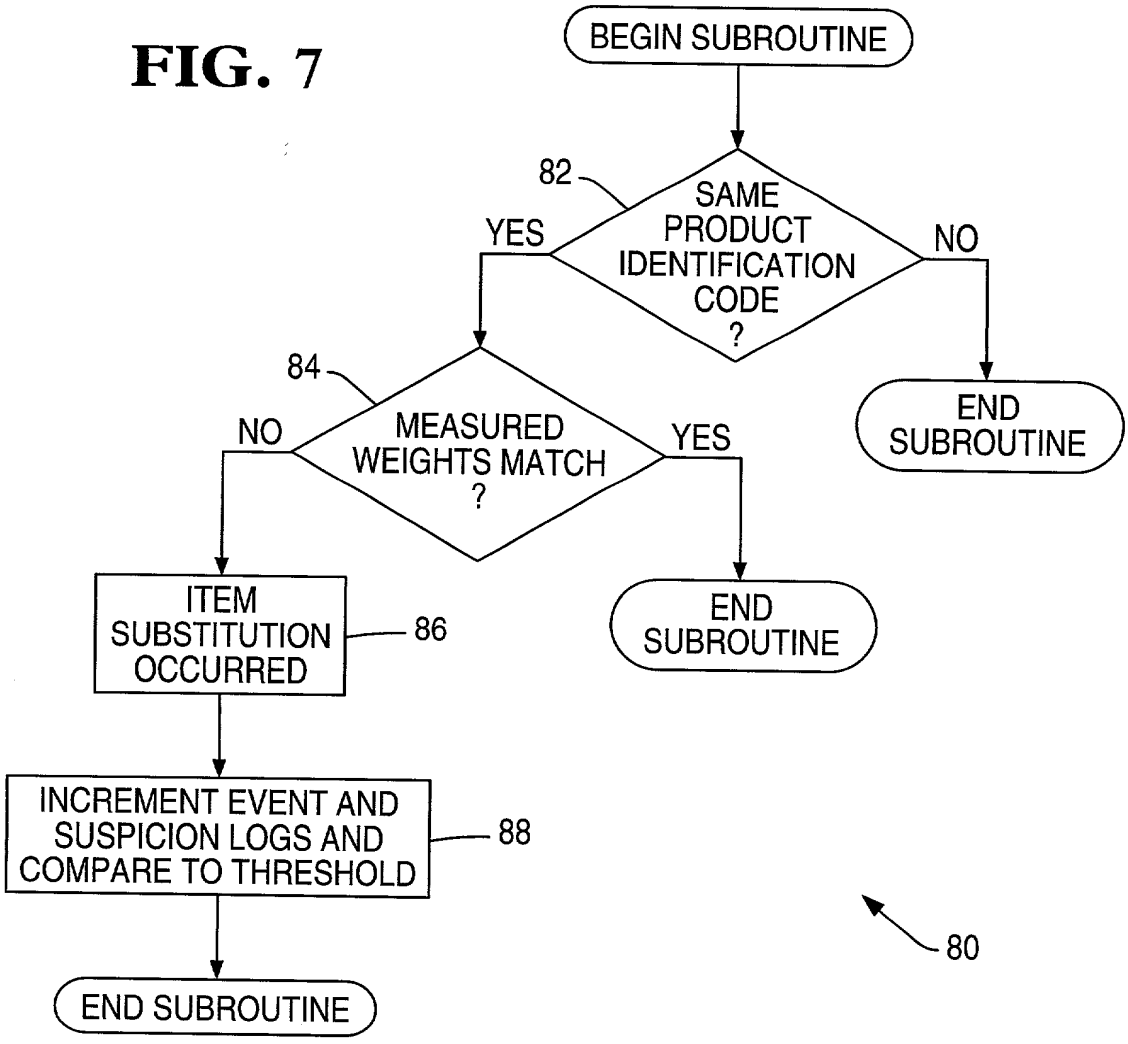
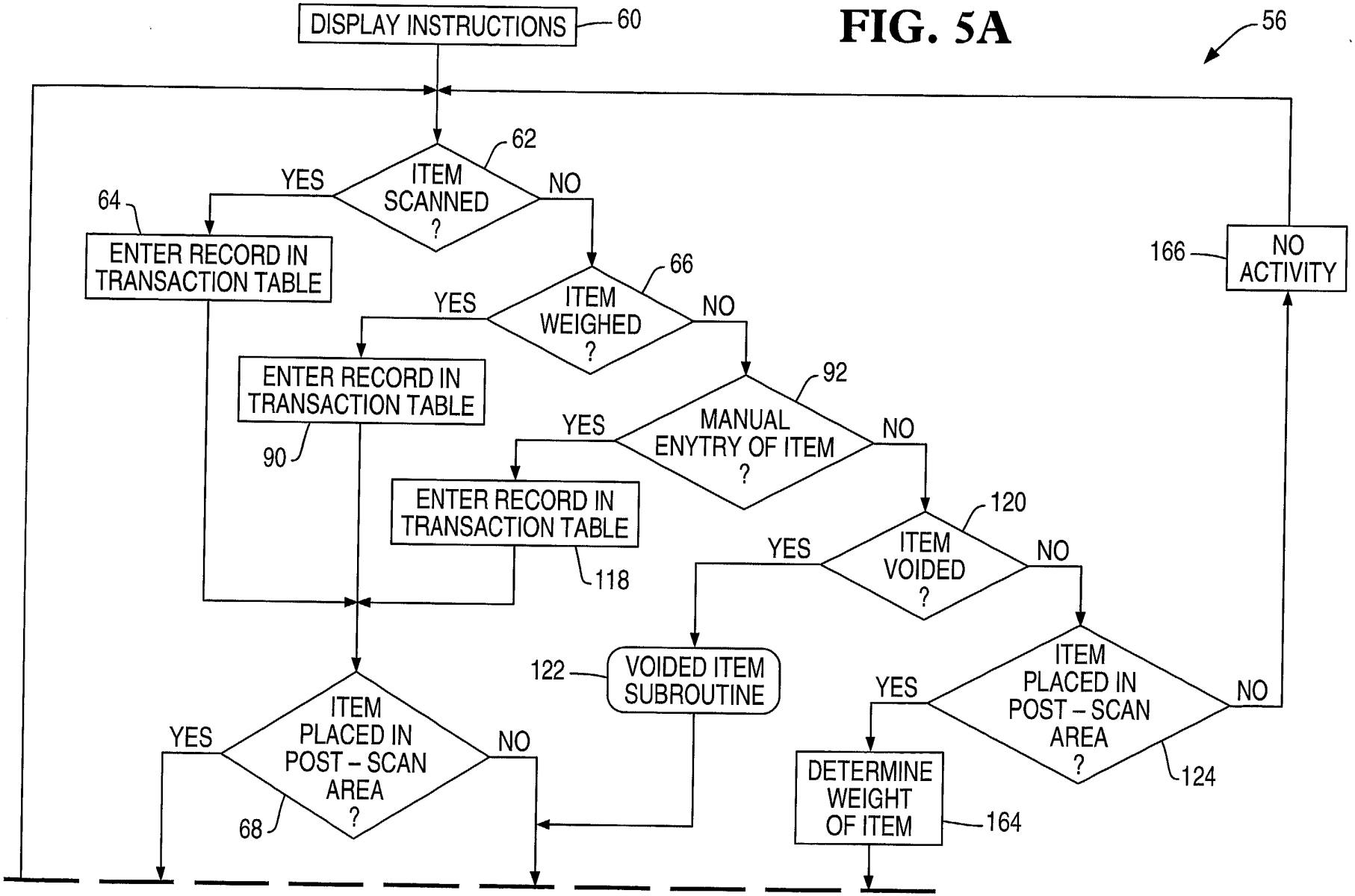

BEGIN SUBROUTINE
82
SAME PRODUCT IDENTIFICATION CODE ?
YES
NO
84
MEASURED WEIGHTS MATCH ?
NO
YES
END SUBROUTINE
ITEM SUBSTITUTION OCCURRED
86
END SUBROUTINE
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
88
END SUBROUTINE
80

FIG. 5A


DISPLAY INSTRUCTIONS
60
56
62
ITEM SCANNED ?
YES
NO
64
ENTER RECORD IN TRANSACTION TABLE
66
ITEM WEIGHED ?
YES
NO
ENTER RECORD IN TRANSACTION TABLE
90
92
MANUAL ENYTRY OF ITEM ?
YES
NO
ENTER RECORD IN TRANSACTION TABLE
118
120
ITEM VOIDED ?
YES
NO
122
VOIDED ITEM SUBROUTINE
ITEM PLACED IN POST – SCAN AREA ?
YES
NO
68
DETERMINE WEIGHT OF ITEM
164
ITEM PLACED IN POST – SCAN AREA ?
YES
NO
124
166
NO ACTIVITY

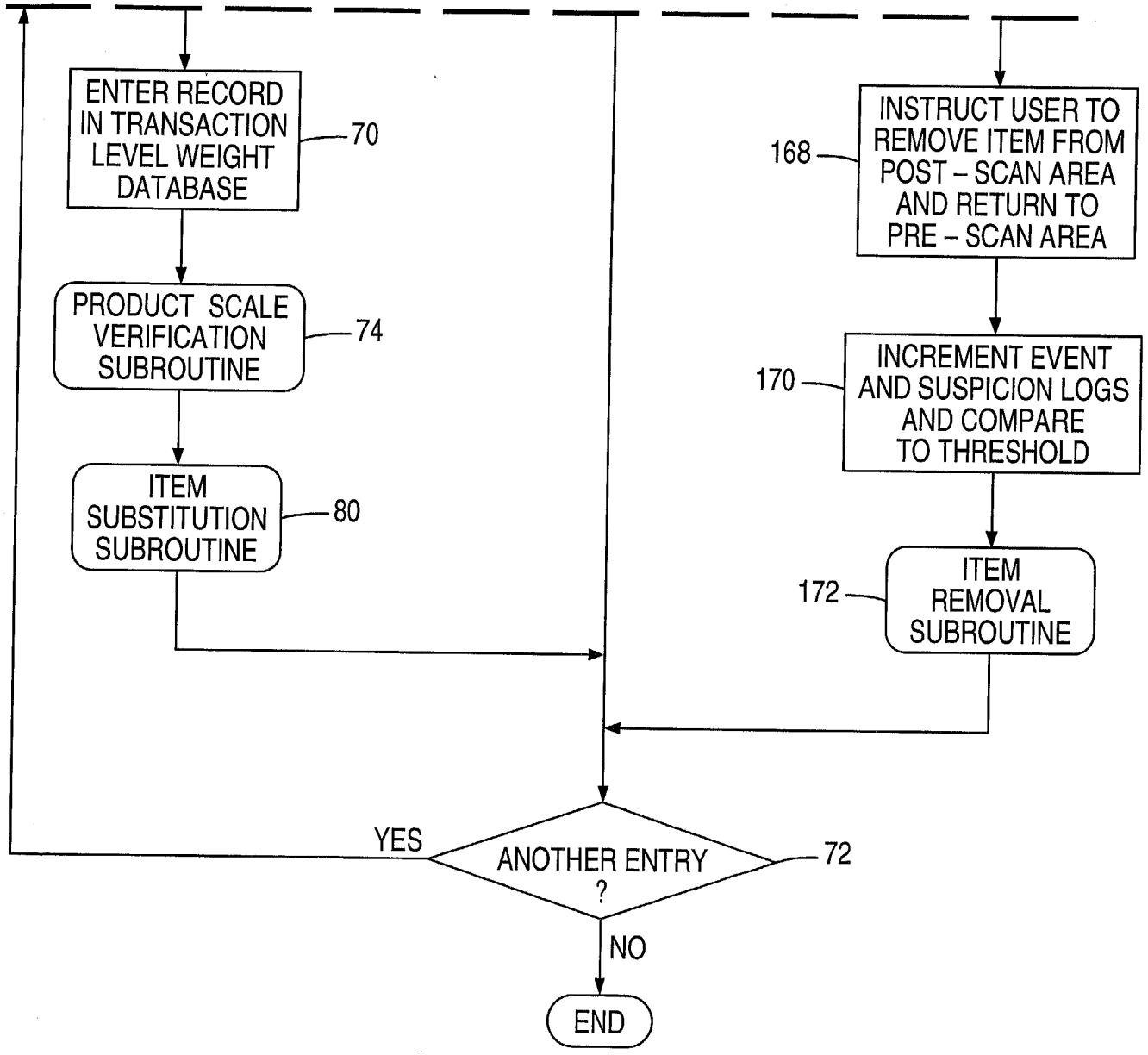
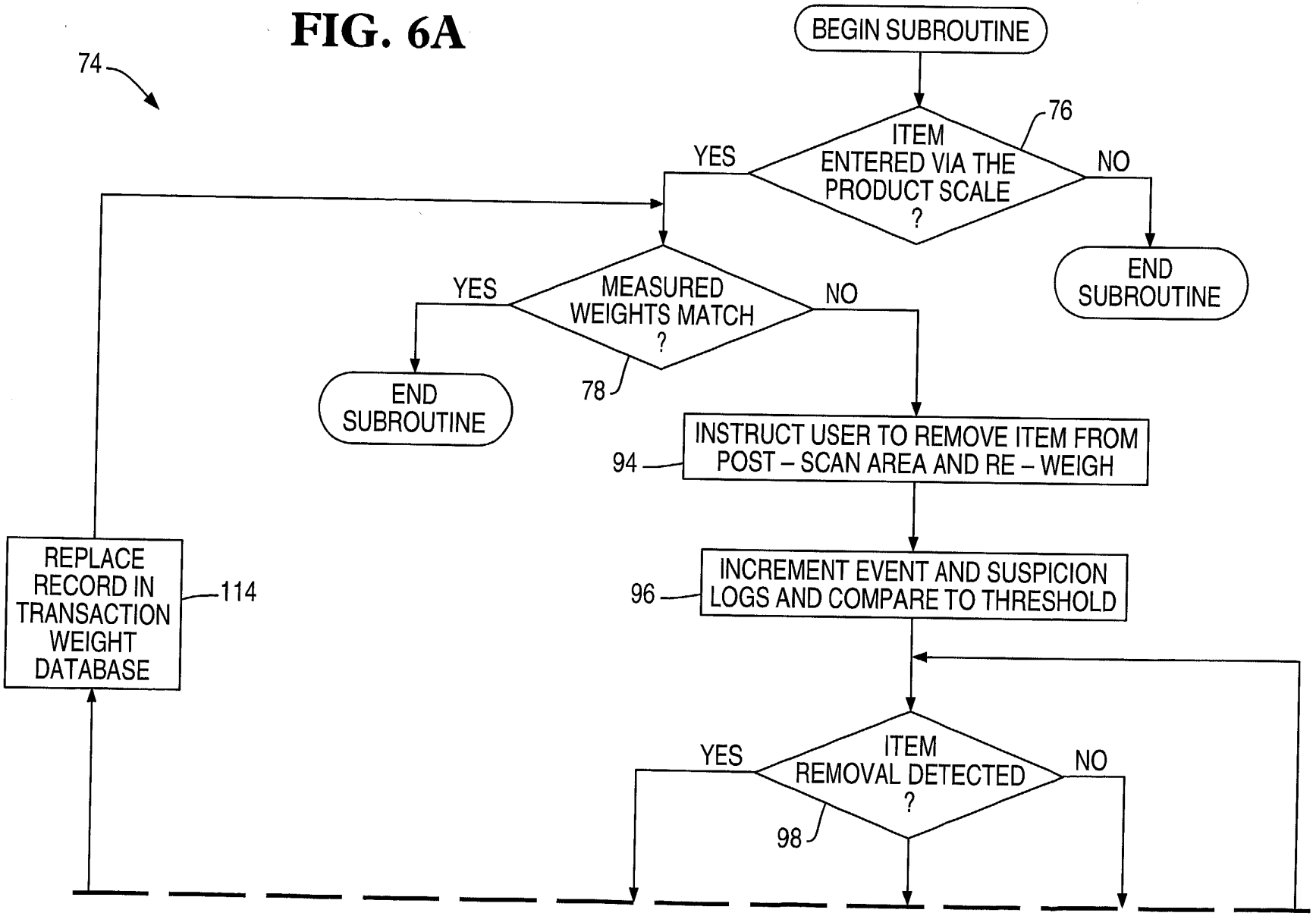

ENTER RECORD IN TRANSACTION LEVEL WEIGHT DATABASE
70
PRODUCT SCALE VERIFICATION SUBROUTINE
74
ITEM SUBSTITUTION SUBROUTINE
80
INSTRUCT USER TO REMOVE ITEM FROM POST – SCAN AREA AND RETURN TO PRE – SCAN AREA
168
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
170
ITEM REMOVAL SUBROUTINE
172
YES
ANOTHER ENTRY ?
72
NO
END

FIG. 5B

FIG. 6A


74
BEGIN SUBROUTINE
ITEM ENTERED VIA THE PRODUCT SCALE ?
76
YES
NO
END SUBROUTINE
MEASURED WEIGHTS MATCH ?
YES
NO
78
END SUBROUTINE
INSTRUCT USER TO REMOVE ITEM FROM POST – SCAN AREA AND RE – WEIGH
94
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
96
REPLACE RECORD IN TRANSACTION WEIGHT DATABASE
114
ITEM REMOVAL DETECTED ?
YES
NO
98

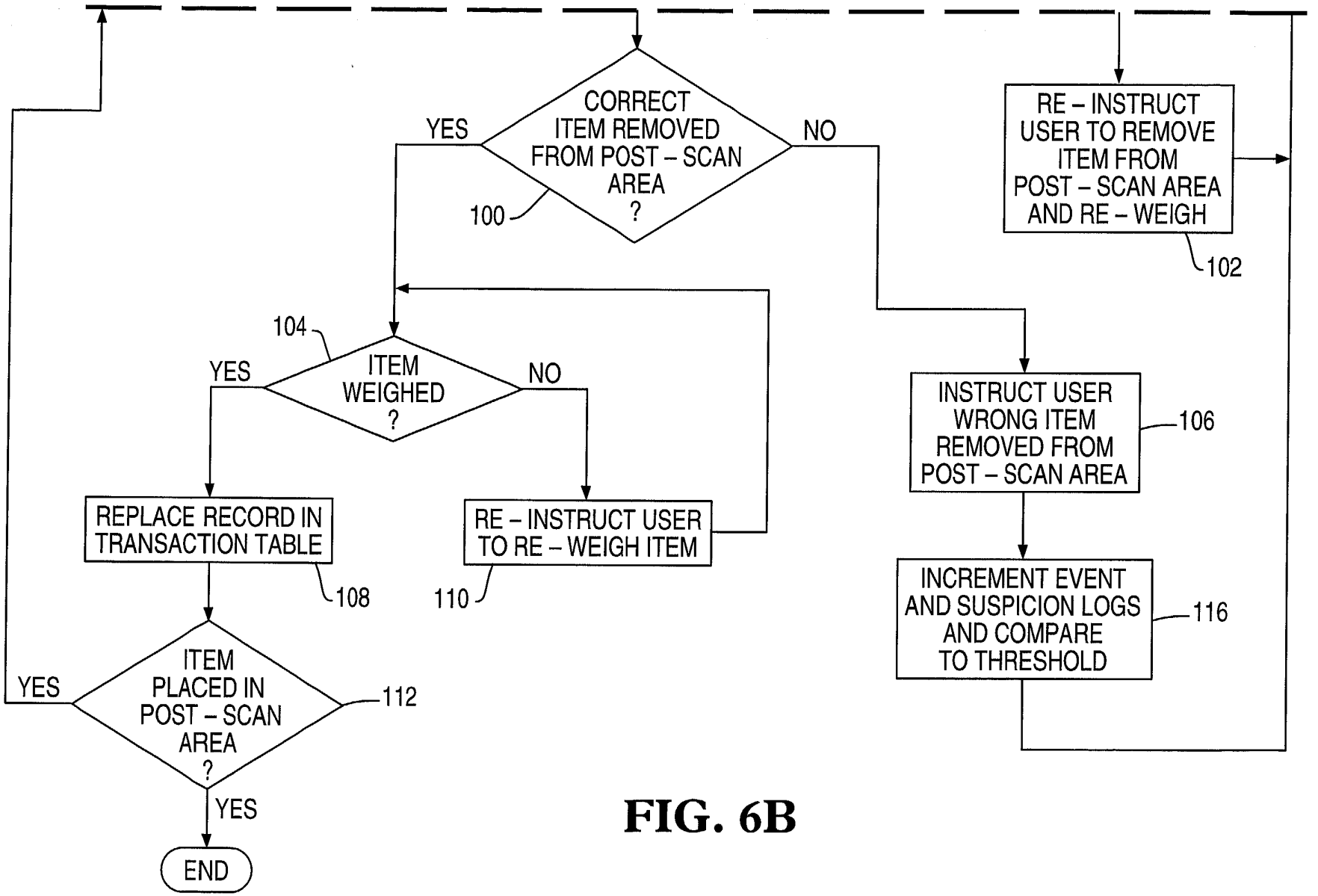

CORRECT ITEM REMOVED FROM POST – SCAN AREA ?
100
YES
NO
RE – INSTRUCT USER TO REMOVE ITEM FROM POST – SCAN AREA AND RE – WEIGH
102
104
ITEM WEIGHED ?
YES
NO
INSTRUCT USER WRONG ITEM REMOVED FROM POST – SCAN AREA
106
REPLACE RECORD IN TRANSACTION TABLE
108
RE – INSTRUCT USER TO RE – WEIGH ITEM
110
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
116
ITEM PLACED IN POST – SCAN AREA ?
112
YES
YES
END

FIG. 6B

FIG. 8

FIG. 8A
FIG. 8B
FIG. 8C

FIG. 8A

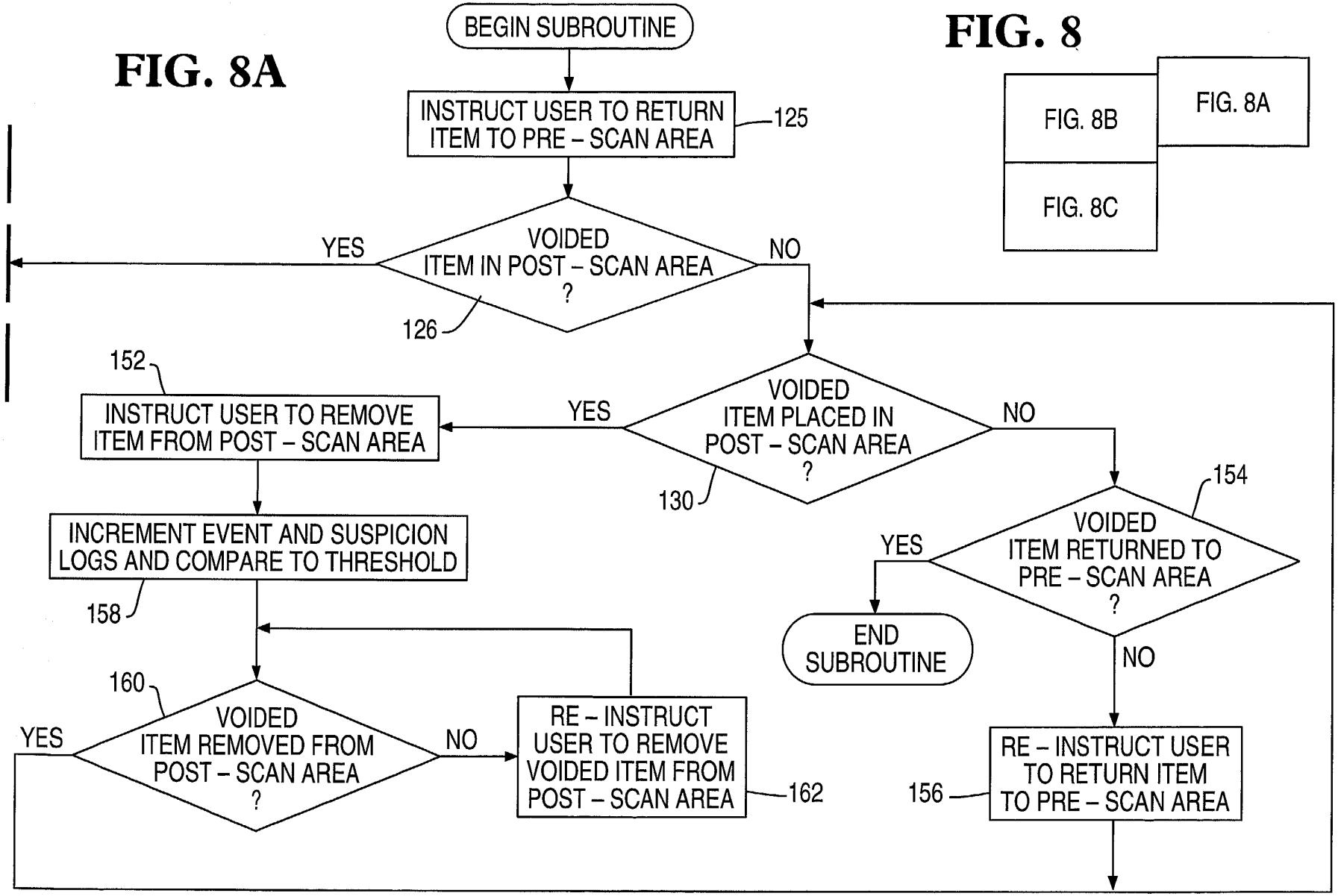

BEGIN SUBROUTINE
INSTRUCT USER TO RETURN ITEM TO PRE – SCAN AREA
125
VOIDED ITEM IN POST – SCAN AREA ?
126
YES
NO
VOIDED ITEM PLACED IN POST – SCAN AREA ?
130
YES
NO
152
INSTRUCT USER TO REMOVE ITEM FROM POST – SCAN AREA
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
158
154
VOIDED ITEM RETURNED TO PRE – SCAN AREA ?
YES
NO
END SUBROUTINE
RE – INSTRUCT USER TO RETURN ITEM TO PRE – SCAN AREA
156
160
VOIDED ITEM REMOVED FROM POST – SCAN AREA ?
YES
NO
RE – INSTRUCT USER TO REMOVE VOIDED ITEM FROM POST – SCAN AREA
162

FIG. 8B

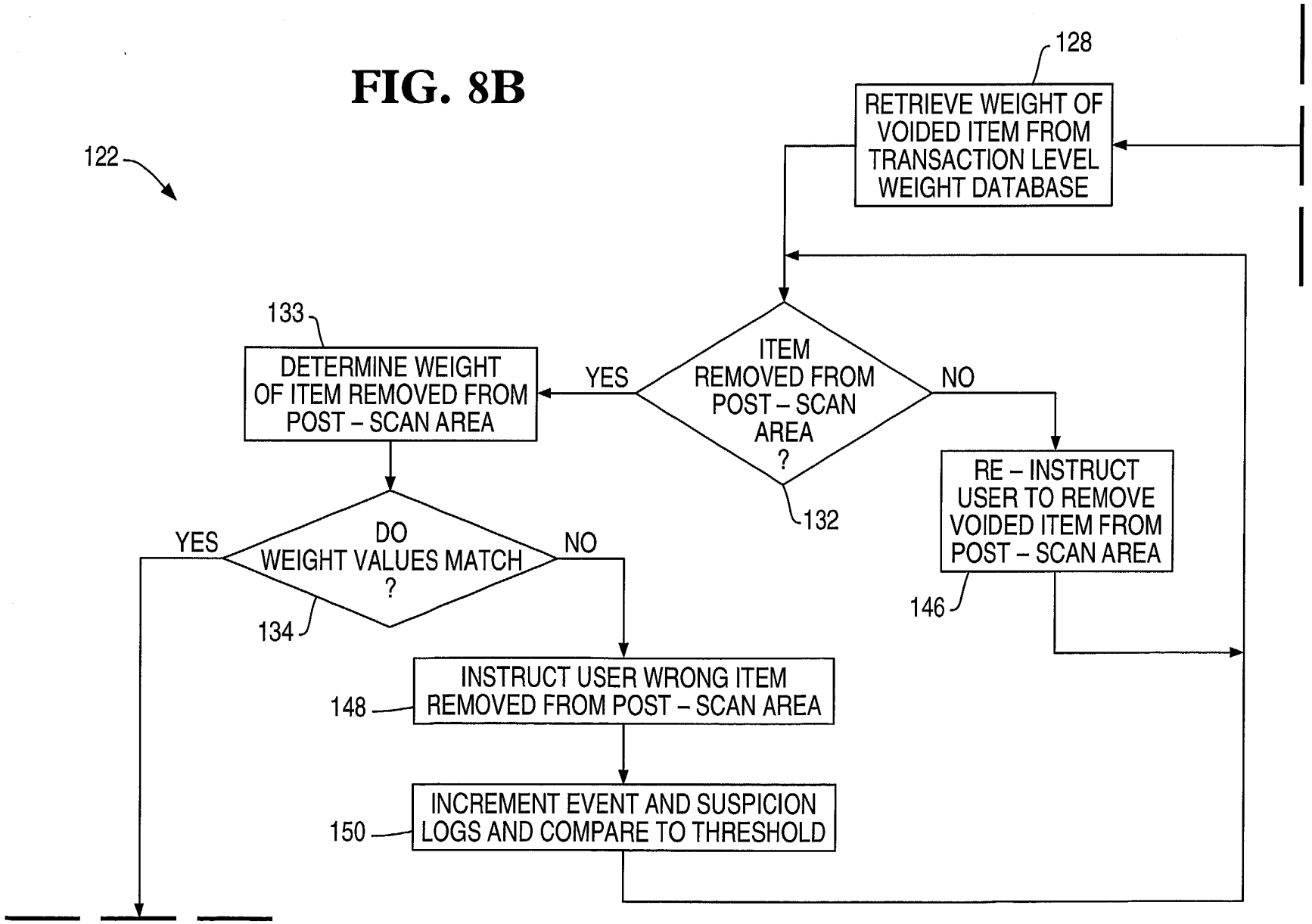

122
128
RETRIEVE WEIGHT OF VOIDED ITEM FROM TRANSACTION LEVEL WEIGHT DATABASE
ITEM REMOVED FROM POST – SCAN AREA ?
132
YES
NO
133
DETERMINE WEIGHT OF ITEM REMOVED FROM POST – SCAN AREA
RE – INSTRUCT USER TO REMOVE VOIDED ITEM FROM POST – SCAN AREA
146
DO WEIGHT VALUES MATCH ?
134
YES
NO
INSTRUCT USER WRONG ITEM REMOVED FROM POST – SCAN AREA
148
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
150

FIG. 8C

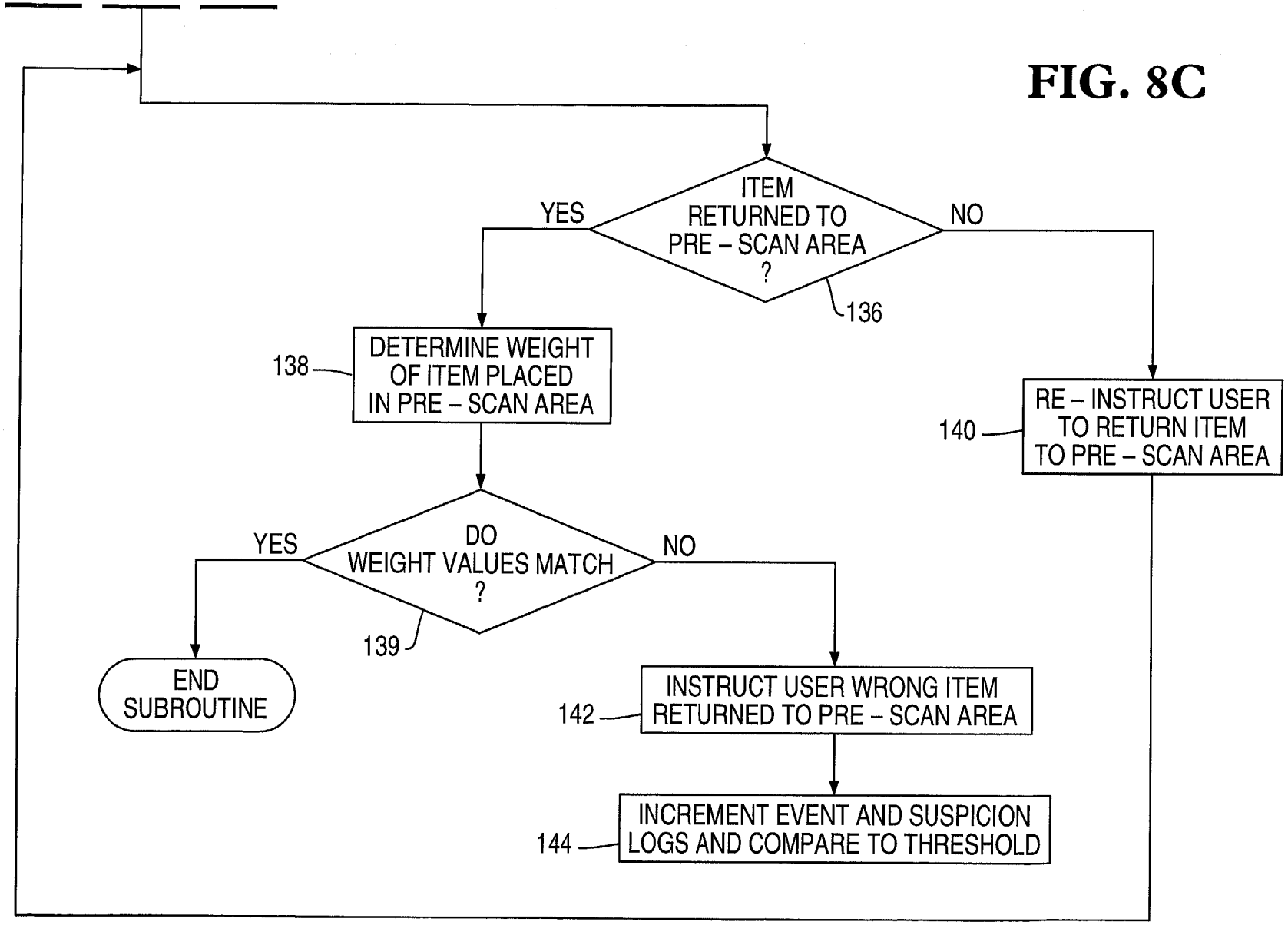
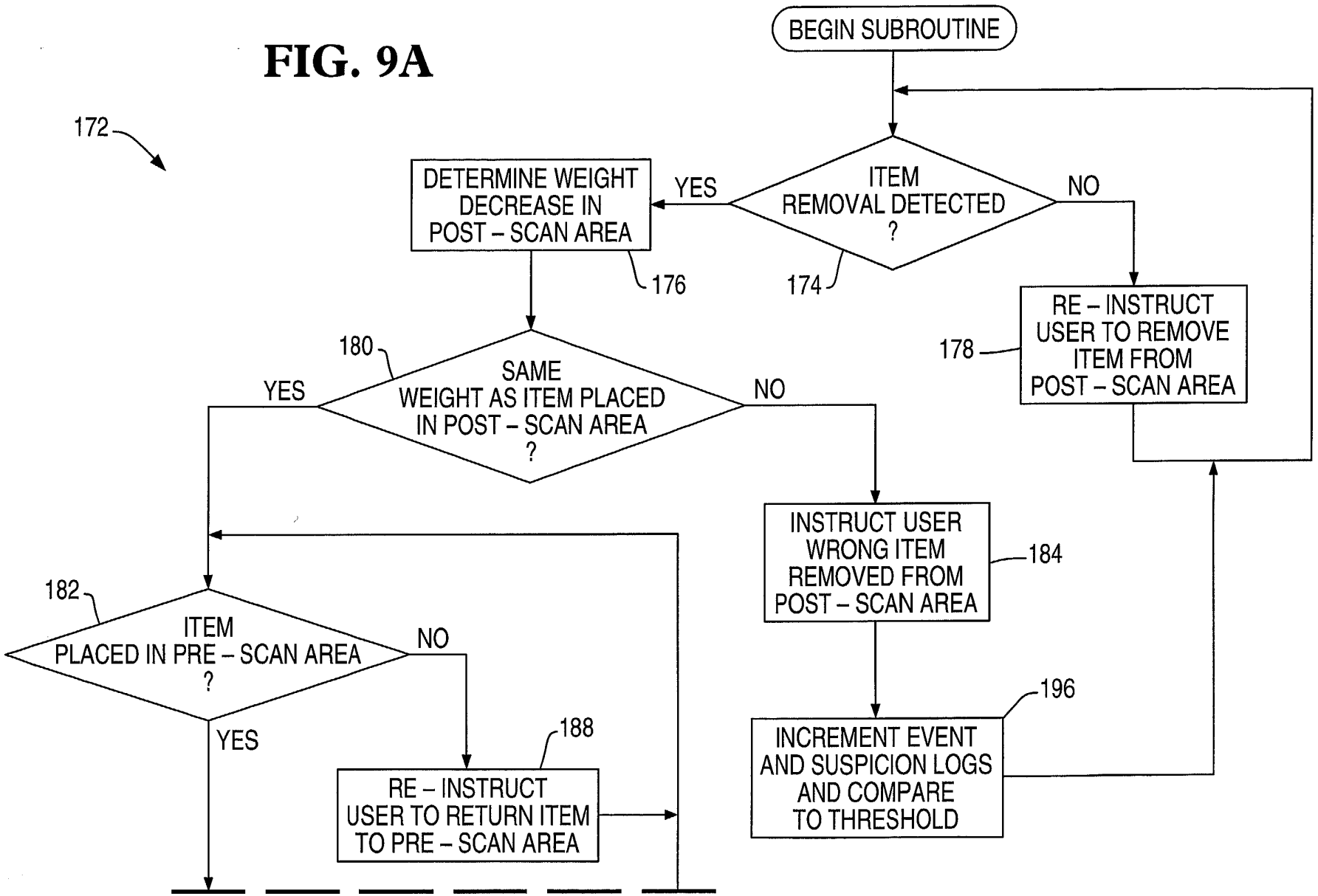

ITEM RETURNED TO PRE – SCAN AREA ?
YES
NO
136
DETERMINE WEIGHT OF ITEM PLACED IN PRE – SCAN AREA
138
RE – INSTRUCT USER TO RETURN ITEM TO PRE – SCAN AREA
140
DO WEIGHT VALUES MATCH ?
YES
NO
139
END SUBROUTINE
INSTRUCT USER WRONG ITEM RETURNED TO PRE – SCAN AREA
142
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
144

FIG. 9A


172
BEGIN SUBROUTINE
ITEM REMOVAL DETECTED ?
174
YES
NO
DETERMINE WEIGHT DECREASE IN POST – SCAN AREA
176
RE – INSTRUCT USER TO REMOVE ITEM FROM POST – SCAN AREA
178
180
SAME WEIGHT AS ITEM PLACED IN POST – SCAN AREA ?
YES
NO
INSTRUCT USER WRONG ITEM REMOVED FROM POST – SCAN AREA
184
182
ITEM PLACED IN PRE – SCAN AREA ?
NO
YES
188
RE – INSTRUCT USER TO RETURN ITEM TO PRE – SCAN AREA
196
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD

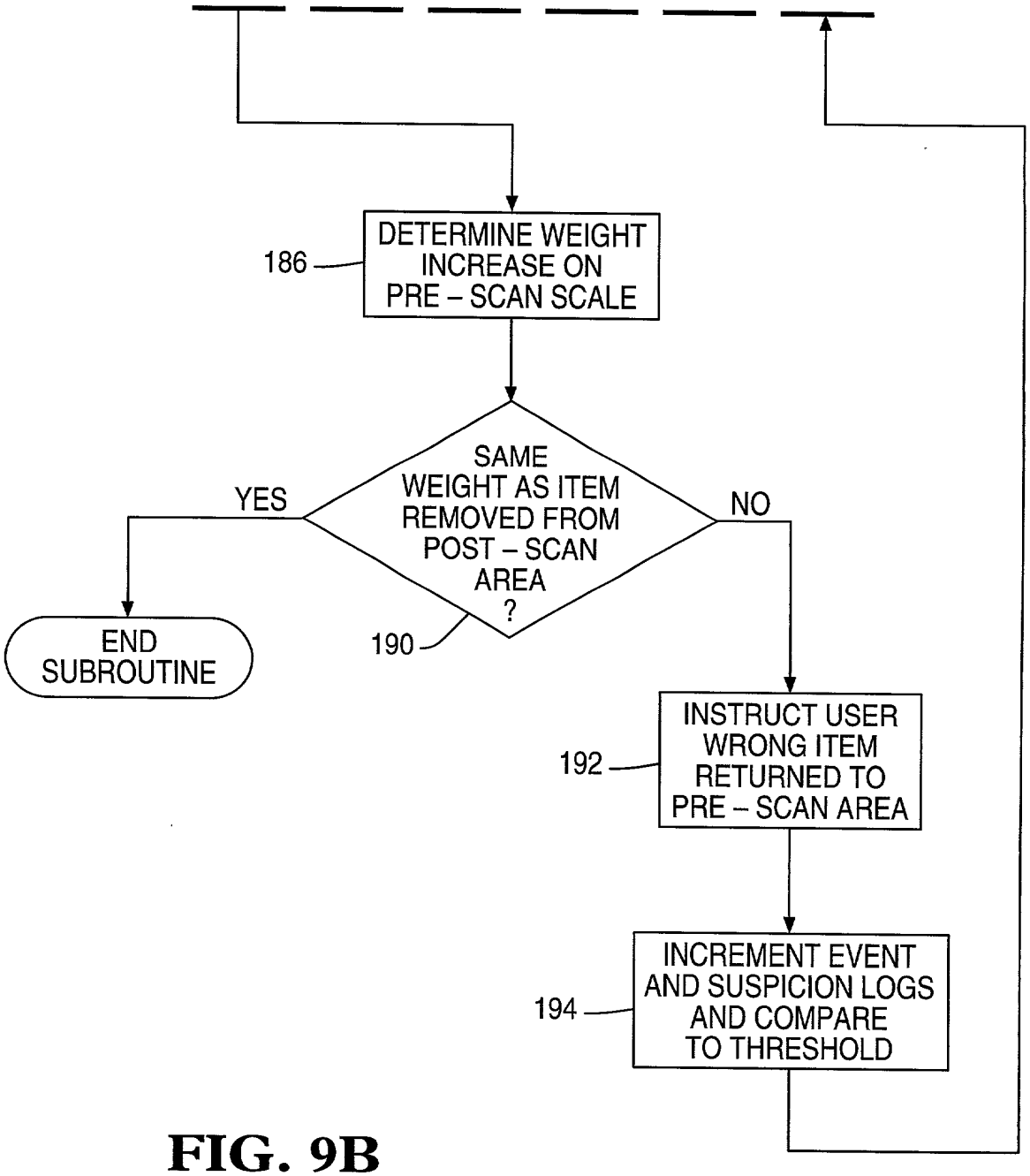
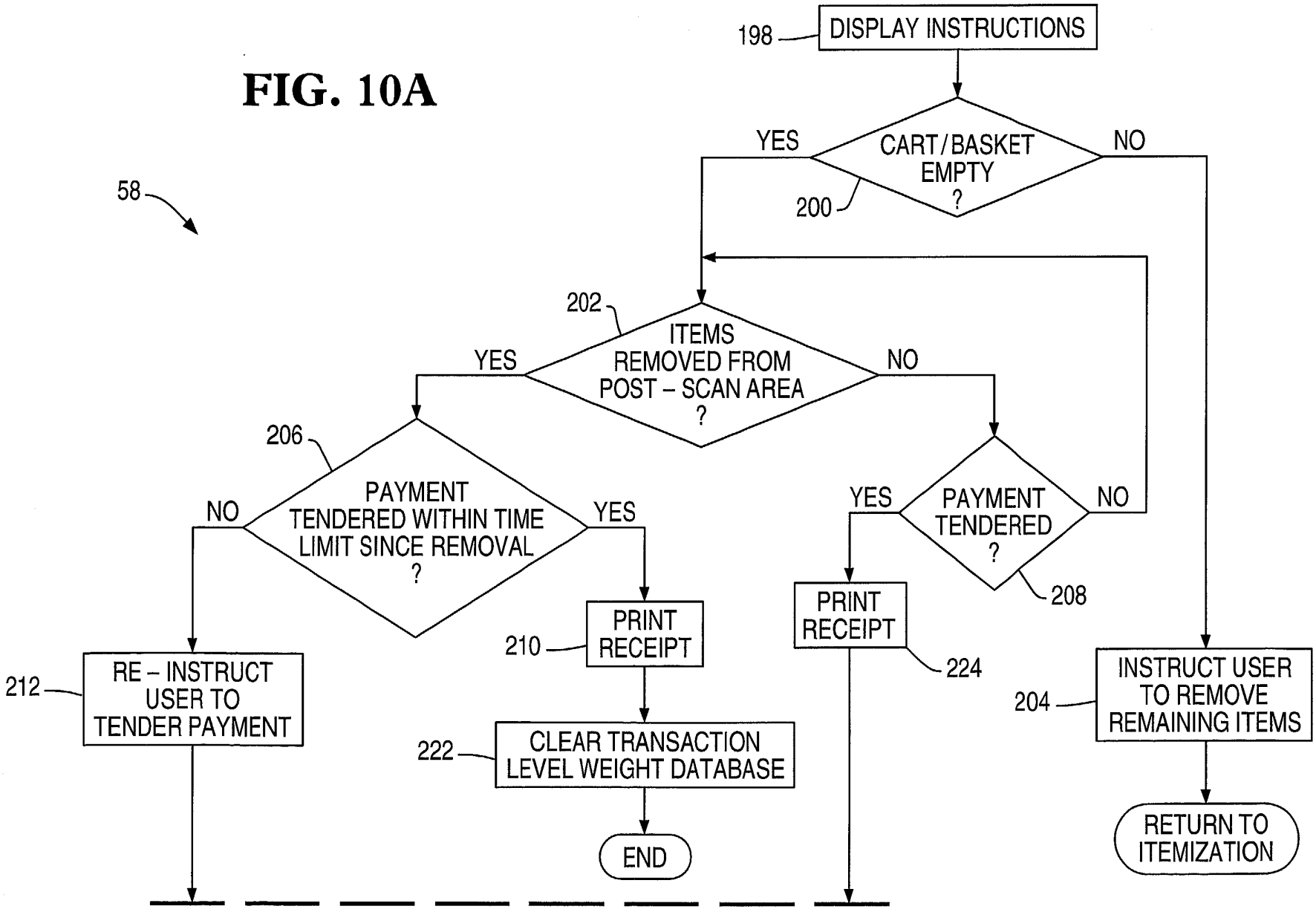

DETERMINE WEIGHT INCREASE ON PRE – SCAN SCALE
186
SAME WEIGHT AS ITEM REMOVED FROM POST – SCAN AREA ?
190
YES
NO
END SUBROUTINE
INSTRUCT USER WRONG ITEM RETURNED TO PRE – SCAN AREA
192
INCREMENT EVENT AND SUSPICION LOGS AND COMPARE TO THRESHOLD
194

FIG. 9B

FIG. 10A


58
198
DISPLAY INSTRUCTIONS
CART/BASKET EMPTY ?
200
YES
NO
202
ITEMS REMOVED FROM POST – SCAN AREA ?
YES
NO
206
PAYMENT TENDERED WITHIN TIME LIMIT SINCE REMOVAL ?
NO
YES
PAYMENT TENDERED ?
YES
NO
208
212
RE – INSTRUCT USER TO TENDER PAYMENT
210
PRINT RECEIPT
222
CLEAR TRANSACTION LEVEL WEIGHT DATABASE
END
PRINT RECEIPT
224
204
INSTRUCT USER TO REMOVE REMAINING ITEMS
RETURN TO ITEMIZATION

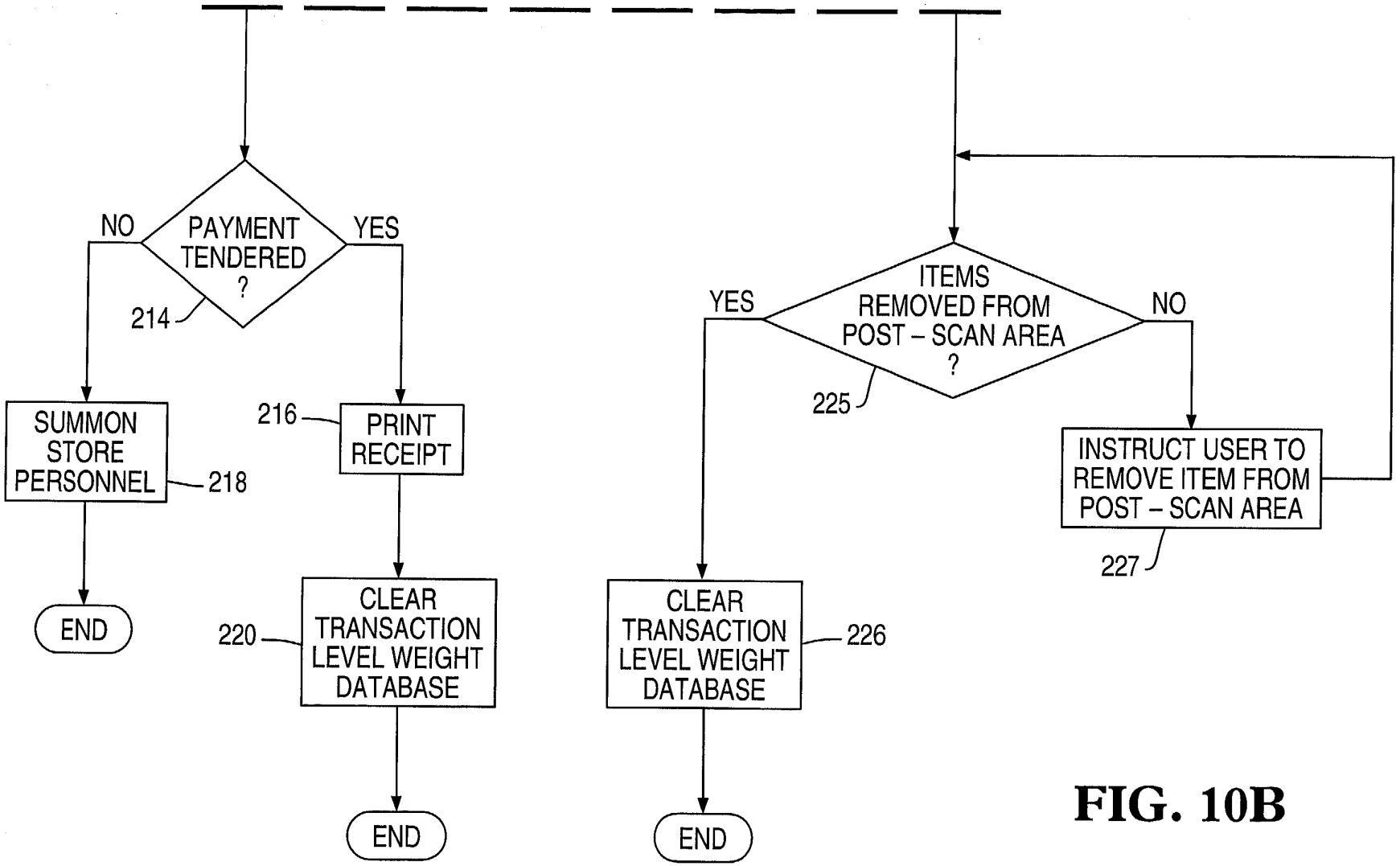

PAYMENT TENDERED ?
NO
YES
214
SUMMON STORE PERSONNEL
218
END
216
PRINT RECEIPT
CLEAR TRANSACTION LEVEL WEIGHT DATABASE
220
END
ITEMS REMOVED FROM POST – SCAN AREA ?
YES
NO
225
INSTRUCT USER TO REMOVE ITEM FROM POST – SCAN AREA
227
CLEAR TRANSACTION LEVEL WEIGHT DATABASE
226
END

FIG. 10B